

Battery-Powered Ascender

Climbing Device Provides Quick Vertical Access for Search, Rescue, and Repair Operations

Technology and Innovation

If firefighters, emergency personnel, construction workers, and military personnel could choose a superhuman power, it might be Spiderman's ability to cast a web and ascend to hard-to-reach places. Though they may lack this superhero power, an innovative personal lifting device now allows them to quickly and easily scale buildings, access windows or airplane cockpits, and reach tall interior spaces without the need for extensive setup or support on the ground.

Under a DARPA SBIR, Quoin International, Inc. developed the PowerQuick® Powered Ascender, a rechargeable battery-operated lifting device that allows people to quickly access high places by ascending a rope. The technology for this device was conceived when Quoin responded to a DARPA request for a powered, lightweight personal lifting device capable of scaling vertical surfaces to gain entrance to upper stories in situations requiring speed and stealth.

PowerQuick® uses now include high-rise search and rescue, vertical evacuation, inspection and repair of structures such as bridges and ships, and maintenance of telecommunication towers. Recently, the PowerQuick® Powered Ascender was used to repair the 60-foot-high domed ceiling of the historic Proctor Theater in Schenectady, New York without removing the seats, installing scaffolding, or shutting down the theater during repairs.

Three models of the device exist with different lifting capacities (200 to 500

pounds) and climbing rates (6 inches to 2 feet per second) to accommodate military and commercial lifting needs ranging from a single worker with tools or equipment to rescue and industrial applications. A climb of 600–800 feet can be accommodated on a fully charged battery.

Joint Collaborations

As a result of the DARPA research and in response to a U.S. Air Force SBIR topic, Quoin is currently developing a system that provides firefighters and rescue personnel with improved access to cockpits to speed pilot extraction under emergency conditions on the ground. This lightweight Personnel Access Rescue Stand (PARS), a portable climbing base for the Powered Ascender, is designed to allow cockpit access in less than 90 seconds, reduce rescue crew injuries and protect expensive airplane coatings during training. The Air Force featured this new equipment at the NATO conference in Paris in July 2006.

Outside of the military, Quoin has received strong support from the University of Nevada, the Reno Department of Mechanical Engineering, the China Lake Mountain Rescue Group, and the Carson City Fire Department.

When Quoin started development, the company discovered that there were no specific safety or other standards for powered ascender devices. Quoin worked with the Society for Professional Rope



Members of the Carson City Fire Department demonstrate horizontal egress for a *Discovery Science Beyond Tomorrow* segment on the PowerQuick ascender.

Access Technicians (SPRAT) in the U.S. and the Industrial Rope Access Trade Association (IRATA) in the UK to develop standards for powered ascenders that meet or exceed all U.S. and international standards for rope access equipment.

Lessons Learned

- Decide early whether to manufacture in house or license the technology. Key factors to consider are financial requirements, production capacity, quality control, manufacturers' market channels, and customer service.
- Be ready to hit the road, attend trade shows, give presentations, and use professionally developed brochures and manuals.
- Conduct a thorough risk assessment and develop mitigation strategies. Risks issues include technology performance, intellectual property protection, standards development, product acceptance, key employee retention, supplier management, and product liability.
- Focus on having trainers use the product. Products used in training are likely to become the preferred choice of trainees as they perform their new skills on the job.

Economic Impact

DARPA SBIR funded about 90 percent of the Powered Ascender's development. The fact that the device was developed under a DARPA contract provided instant credibility for Quoin and the product. Additional DARPA funding for personnel rating and safety testing further enhanced credibility and alleviated safety concerns.

DARPA was also a tremendous help in providing valuable military contacts early on, and the DARPA effort was directly responsible for Quoin winning the additional Air Force development program (PARS).

Quoin has applied for international patents for the PowerQuick® Powered Ascender and has filed copyrights to assist in branding. In November of 2004, Quoin established Bonanza



(Left) Members of the Fort Bragg, North Carolina U.S. Army Special Operations Command evaluating the PowerQuick for deployment. (Right) Prize Construction uses the PowerQuick Ascender to perform ceiling repairs on a 60-foot domed ceiling in the historic Proctor's Theater in Schenectady NY without removing the seats, installing scaffolding and shutting down the theater during the repairs.

Products, Inc. as a separate subsidiary corporation to commercialize the PowerQuick® product line. Bonanza currently has over 20 distributors located in the U.S. and around the world.

About the Company

Quoin International, Inc. is an engineering, technology development, manufacturing, and service company that specializes in power, control, actuation, and pyrotechnics technology development. The company was founded in December of 2001 and is located in Carson City, Nevada. ■

Company Information

Quoin International, Inc.
3000-B Conestoga Drive
Carson City, NV 89706
Phone: 775.882.8100
Fax: 775.882.8158
www.quointech.com/
www.powerquickascender.com/

Founded: December 2001
Number of employees: 21
(Quoin: 9; Bonanza
Products, Inc.: 12)